ORIGINATOR: Gary Kirby Jr. 
EFF TERM: Fall 2018
FORMERLY KNOWN AS: 
DATE OF OUTLINE/REVIEW: 03-25-2016
CROSS LISTED COURSE: 
TOP NO: 1701.00
CID: MATH 221

SEMESTER UNITS: 5.0
HRS LEC: 90.0 HRS LAB: 0.0 HRS OTHER: 0.0
CONTACT HRS TOTAL: 90.0
STUDY NON-CONTACT HRS RECOMMENDED: 180.0

CATALOG DESCRIPTION:
This is the second course in a three-course sequence designed for mathematics, science and engineering majors. The topics covered in this course include methods of integration, applications of the definite integral, polar and parametric functions, improper integrals, convergence and divergence of sequences and series including power series, and conic sections. (The student should plan to complete the first three semesters of calculus at Golden West College to maintain continuity.) C-ID MATH 221

JUSTIFICATION FOR COURSE:

PREREQUISITES:
- MATH G180: Calculus 1 with a minimum grade of C or better or
- MATH G180H: Calculus I, Honors with a minimum grade of C or better or
- MATH A180: Calculus 1 with a minimum grade of C or better or
- MATH A180H: Calculus 1 Honors with a minimum grade of C or better or
- MATH C180: Calculus 1 with a minimum grade of C or better

COREQUISITES:
ADVISORIES:
ASSIGNED DISCIPLINES:
Mathematics

MATERIAL FEE: Yes [ ] No [X] Amount: $0.00

CREDIT STATUS: Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

GRADING POLICY: Pass/No Pass [ ] Standard Letter [X] Not Graded [ ] Satisfactory Progress [ ]

OPEN ENTRY/OPEN EXIT: Yes [ ] No [X]

TRANSFER STATUS: CSU Transferable[ ] UC/CSU Transferable[X] Not Transferable[ ]

BASIC SKILLS STATUS: Yes [ ] No [X] LEVELS BELOW TRANSFER: Not Applicable

CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable

NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course

OCCUPATIONAL (SAM) CODE: E

REPEATABLE ACCORDING TO STATE GUIDELINES: No [X] Yes [ ] NUMBER REPEATS:
REQUIRED FOR DEGREE OR CERTIFICATE: No [ ] Yes [X]
Computer Science (Associate in Science for Transfer)
Geology (Associate in Science for Transfer)
Liberal Arts: Emphasis in Mathematics (Associate in Arts)
Mathematics (Associate in Science for Transfer)
Mathematics (Associate in Arts)
Physics (Associate in Arts)
Physics (Associate in Arts)

GE AND TRANSFER REQUIREMENTS MET:
IGETC Area 2: Mathematical Concepts and Quantitative Reasoning
   2A: Mathematics
CSU GE Area B: Scientific Inquiry and Quantitative Reasoning
   B4 - Mathematics/Quantitative Thinking

PROGRAM LEVEL LEARNING OUTCOME(S) Supported by this course:

apply concepts of differential and integral calculus of one or more variables to solve problems involving rates, area, volume, and lengths of arcs.

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COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. determine whether a series is convergent or divergent using an appropriate test for convergence.
2. Apply techniques of integration to evaluate definite and indefinite integrals.
3. solve applications of integration including areas, volumes, surface areas of revolution, and arc length.

COURSE OBJECTIVES:
1. Apply various techniques in the evaluation of indefinite and definite integrals, including improper integrals.
2. Solve a variety of applications of integration including areas, volumes, surface areas of revolution, arc lengths and center of mass.
3. Determine whether a sequence or series is convergent or divergent.
4. Classify a convergent series as absolutely convergent or conditionally convergent.
5. Graph and write equations for all conic sections.
6. Graph and write equations in polar and parametric coordinates.
7. Solve first-order differential equations.
8. Construct and analyze Taylor and Maclaurin series.
9. Graph, differentiate and integrate functions in polar and parametric form.

COURSE CONTENT:

LECTURE CONTENT:

   A. Applications of the Definite Integral
      1. Area between two curves.
      2. Volumes by slicing, disks and washers.
      3. Volumes by cylindrical shells.
4. Length of a plane curves.
5. Area of a surface of revolution
6. Average value of a function and its applications.
7. Work, growth and decay.
8. Moments and centers of mass in one and two dimensions.

B. Techniques of Integration
1. Integration by parts
2. Trigonometric integrals
3. Trigonometric substitutions
4. Integrating rational functions by partial fractions
5. Numerical Integration
6. Trapezoidal and Simpson's Rule
7. Improper integrals
8. Integrals Involving Hyperbolic and Inverse Hyperbolic Functions

C. Mathematical Modeling with Differential Equations
1. First-order differential equations
2. Applications of first-order differential equations
3. Slope fields
4. Euler's method (optional)
5. Second-order linear homogeneous differential equations (optional)
6. Applications of second-order linear homogeneous differential equations (optional)

D. Infinite Sequences and Series
1. Sequences
2. Infinite series including alternating series, geometric series, binomial series, etc.
3. Convergence tests such as comparison, ratio, root, alternating series, and integral tests, etc.
4. Absolute and conditional convergence
5. Maclaurin and Taylor polynomials
7. Power series
8. Differentiating and integrating power series
9. Applications of series

E. Analytic Geometry in Calculus
1. Polar coordinates
2. Tangent lines for parametric and polar curves
3. Arc length for parametric and polar curves
4. Area of the surface of revolution for parametric and polar curves
5. Area in polar coordinates
6. Conic sections in calculus
7. Rotation of axes; second-degree equations (optional)
8. Conic sections in polar coordinates (optional)

METHODS OF INSTRUCTION:

A. Lecture:
B. Tutoring – noncredit:
C. Direct Study/IS:
D. Dist. Ed – Delayed Interaction:
E. Video One Way – Audio Two Way:
F. Two-way interactive audio only:  
G. Other simultaneous interactive:  
H. Audio – One Way:  
I. Other passive medium:  
J. Independent Study:  

INSTRUCTIONAL TECHNIQUES:  

COURSE ASSIGNMENTS:  
Reading Assignments  
A. Required Reading such as:  
Course textbook which provides explanations, worked examples, and problems to be solved.  

Out-of-class Assignments  
Optional computer assignments.  

Writing Assignments  
Homework, quizzes, and examinations covering topics presented in the course.  

METHODS OF STUDENT EVALUATION:  
Midterm Exam  
Final Exam  
Short Quizzes  
Written Assignments  
Essay Examinations  
Objective Examinations  
Projects (ind/group)  
Problem Solving Exercises  

Demonstration of Critical Thinking:  
Analysis and application of mathematical techniques presented in the course; mathematical modeling and computational methods.  

Required Writing, Problem Solving, Skills Demonstration:  
Homework, quizzes, and examinations covering topics presented in the course.  

TEXTS, READINGS, AND RESOURCES:  
TextBooks:  

LIBRARY:  
Adequate library resources include:  

Comments:  

Attachments:  
Attached Files